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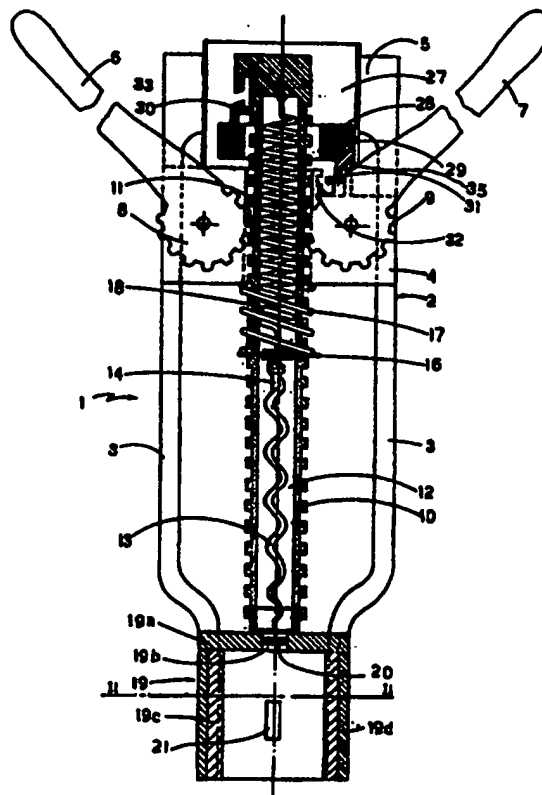
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(54) Title: **CORKSCREW WITH SCREWING, EXTRACTION AND AUTOMATIC EXPULSION OF CORKS**

(57) Abstract

The present invention is applied in the field of corkscrews for corks inserted into bottles. The corkscrew has a framework (2) provided with guide bars for a mobile carriage (4) which are joined together on the top by a crosspiece (5). Two levers (6 and 7) are housed in the mobile carriage so as to carry out the vertical sliding of a toothed, hollow shaft (10) having a coaxial cavity (12) inside which is housed a thread (13) which can vertically translate and rotate about its own axis. Constraining means are foreseen either for the mobile carriage or the toothed, hollow shaft to the crosspiece (5).



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CORKSCREW WITH SCREWING, EXTRACTION AND AUTOMATIC  
EXPULSION OF CORKS

Description

The present invention relates to a corkscrew with screwing, extraction and automatic expulsion of corks for bottles.

05 More precisely, the present invention refers to a corkscrew of the type provided with a thread which is inserted into the cork automatically by means of a vertical translation of a thread-bearing bar.

10 In this type of corkscrew, the rotation of the thread takes place automatically during the vertical translation since said thread is free to rotate with respect to the bar holding said thread and the rotation comes about by means of a bar or a helical guide, which is inserted into a hole  
15 through which the thread is passed before penetrating into the cork.

However, in this type of corkscrew, the withdrawal of the thread of the extracted cork has to be done

manually, that is, by making the cork rotate manually with respect to the thread, thus causing a notable waste of time.

05 Furthermore, this type of corkscrew is placed on the rim of the bottle neck without foreseeing a blockage between the rim of the bottle neck and the corkscrew, and so, particular attention has to be paid in the phase of insertion of the thread into the cork, and a very strong pressure has to  
10 be made on to the corkscrew itself.

The aim of the present invention is to eliminate the above mentioned drawbacks and in particular to be able to carry out both the screwing, the extraction and the expulsion of the thread into  
15 the cork and from the cork, automatically, by means of a simple translating operation of a thread-bearing bar.

A further aim of the present invention is to make stable, and without operating difficulties, both  
20 the introduction of the thread into the cork and the extraction of the thread from the cork.

Said aims and others are achieved by the corkscrew according to the present invention which is characterised in the appended claims.

25 Further characteristics and advantages of the

present invention will better emerge from the detailed description that follows of a preferred embodiment here illustrated in the form of a non-limiting example, in which:

- 05     - Figure 1) shows the corkscrew in a longitudinal section and in the position of the starting operation of uncorking;
- Figures 2) and 3) show the corkscrew according to a view of figure 1) in the two successive
- 10     uncorking phases;
- Figure 4) shows a lateral view of the corkscrew;
- Figure 5) shows the neck of a bottle with a constraining particular housed in the corkscrew;
- Figure 6) shows a particular of the corkscrew in
- 15     an elevation view;
- Figure 7) shows the particular of figure 6) from a top plan view;
- Figure 8) shows a particular of the corkscrew according to the section I-I of figure 1.

20     With reference to the figures, 1 denotes the corkscrew which is composed of a fixed structure or framework 2 provided with two couples of guide bars 3 along which a mobile carriage 4 can slide; at the top, the guide bars are connected to a

25     crosspiece 5.

In the mobile carriage, two levers 6 and 7 are pivoted, said two levers bearing two cog wheels 8 and 9, said cog wheels engaging to a toothed, hollow shaft 10 sliding within a hole 11 which passes through the mobile carriage and inside the crosspiece 5.

The levers 6 and 7 are maintained in position by two external plates 6a and 7a which are screwed in correspondence with the axis of rotation of the two cog wheels 8 and 9.

The toothed, hollow shaft 10 shows a coaxial cavity 12 inside which a thread 13 can slide, said thread being able to rotate about a pin 14, constrained to a plate 16, sliding within slits 15 (as shown in figures 6 and 7) obtained in said toothed, hollow shaft.

A spring 17 is inserted between the plate 16 and the mobile carriage, while another spring 18 is inserted into the cavity 12, said spring connecting the plate 16 to the bottom of the toothed, hollow shaft in such a way so as to maintain the thread 13 pulled towards the top inside said cavity.

A cap 19 is inserted at the bottom of the guide bars which is free to slide along said guide bars,

said cap comprising a disk 19a provided with a through hole 19b, which has a diameter slightly higher than that of the external diameter of the thread, having a bar or a helical guide 20, which forces the thread to rotate when said thread is vertically translated, as will be described in the following description.

The disk 19a comprises two bars 19d sliding vertically inside grooves obtained in a cylindrical body 19c.

The cylindrical body 19c is provided with longitudinal grooves within which are inserted the ends of the guide bars, which in said part are close to each other, and the bars of the cap as shown in figure 8.

The lateral surface of said cylindrical body has two slits 21 through which are inserted two flat springs 23 shaped in such a way that they can be inserted under the rim of the neck 24 of the bottle 25 so as to hold the bottle during the thread screwing phase.

The flat springs 23 are pivoted in 22 and are pressed by springs 26 towards the neck of the bottle, said springs showing a portion outside the cylindrical body on which it is possible to act by

pressing using one's fingers so as to unhook the bottle.

05 In the crosspiece 5 is provided a housing 27 into which is inserted a block 28 which is subject to a slight horizontal oscillation.

The block 28 is provided with a slot 29 through which the toothed hollow shaft 10 passes.

10 The block 28 also bears an upper fork 30 to be inserted between the teeth of the toothed, hollow shaft, and a lower fork 31 to be inserted into a notch 32 obtained in the mobile carriage.

15 In order to carry out the insertion of one or the other of the forks into the respective cavity, a projection 33 having the shape of an inclined plane is provided in correspondence with the upper fork, which projection 33 acts on the upper fork, and vice versa, on the carriage 4 is provided a projection 34 having the shape of an inclined plane, which projection 34 acts on an inclined plane 35 which is obtained on the block 28.

20 The block 28, the forks 30 and 31, the projections 33 and 34 are means for carrying out the constraining between the toothed, hollow shaft and the crosspiece or between the mobile carriage and  
25 the crosspiece.



The functioning of the corkscrew is described below.

05 The corkscrew is positioned on the top of the bottle with the two levers 6 and 7 raised, as shown in figure 1) thanks to the spring 17 which maintains the mobile carriage pushed upwards.

10 In this position, the upper fork 30 is inserted in one of the external cavities of the shaft 10 and so said shaft 10 is constrained to the crosspiece 5 of the framework, while the mobile carriage 4 is free to translate towards the bottom.

15 At this point, the neck of the bottle is inserted into the cap 19 as far as the rim of the bottle neck is held back by the two flat springs, said springs opening in the introduction phase and closing under the rim of the bottle neck.

20 At this point, the rotation of the two levers 6 and 7 begins, causing the descent of the mobile carriage 4 in contrast with the action of the spring 17.

25 During the run of the descent, the spring 17, which is compressed by the carriage, acts against the plate 16 pushing it towards the bottom together with the thread 13 in contrast with the action of the spring 18.

The thread 13 will start to come out of the cavity 12 and at the same time will be forced to rotate by the bar or helical guide 20, thus beginning the penetration into the cork.

05 The run of the descent will continue until the thread is penetrated up to an adequate depth, thus guaranteeing a strong union between the thread and the cork, as shown in figure 2).

Releasing at this point the levers, the carriage  
10 automatically returns to the top because of the extension of the spring 17 which has been previously compressed.

In the final phase of the raising run, the tooth  
34 constrained to the mobile carriage will move  
15 the block 28 towards the left in such a way so as to carry out the release of the fork 30 and the hooking up of the lower fork in the seat 32 in such a way that the mobile carriage remains hooked to the crosspiece 5 and the toothed hollow shaft  
20 is free to vertically translate upwards when a second rotation of the levers 6 and 7 towards the bottom begins.

During this second rotation of the levers, the raise of the thread towards the top comes about  
25 and at the same time occurs the raise of the cap

19 which slides along the base of the corkscrew, thus causing the extraction of the cork from the bottle, as shown in figure 3).

05 Once terminated the extraction phase, the expulsion of the cork from the thread comes about since, during the further phase of raising, the thread is forced to rotate in the opposite direction to that described above.

10 The cork is left inside the corkscrew and can be removed manually.

The cap 19 returns to its initial housing while the toothed, hollow shaft 10 returns towards the bottom pushed by the spring 17, and with the thread recalled by the spring 18 in the cavity 12.

15 The shaft 10, during the final phase of descent, strikes with the inclined plane 33 against the block 28 moving it towards the right, thus inserting the fork into the cavity of the shaft while the mobile carriage is freed from the fork  
20 32.

The present invention can be susceptible to numerous variations or changes, for example the constraining means of the toothed, hollow shaft 10, and the mobile carriage 4 at the crosspiece 5  
25 can be made in a different way, without falling

outside the field of the following claims.

Claims

1. A corkscrews with screwing, extraction and automatic expulsion of corks characterised in that it comprises:
  - a framework (2) provided with guide bars (3) for the sliding of a mobile carriage (4), said guide bars being joined together at the top by a crosspiece (5);
  - two levers (6) and (7) housed in the mobile carriage which are capable of causing the vertical sliding of a toothed, hollow shaft (10) having a coaxial cavity (12) inside; a thread (13) is housed inside said coaxial cavity (12) and said thread can vertically translate and rotate about its own vertical axis;
  - means for carrying out the constraining of the toothed, hollow shaft (10) to the crosspiece (5) or, in alternative, the constraining of the mobile carriage (4) to the crosspiece (5);
  - a cap (19) connected to the guide bars (3) with the possibility to slide along the the guide bars

themselves, said cap being provided with a bar or helical guide (20) capable of forcing the rotation of the thread (13) when this is made to translate vertically towards the bottom pushed by the mobile carriage (4).

2. A corkscrew, as claimed in claim 1, characterised in that it comprises a spring (17) which is inserted between the mobile carriage (4) and a plate (16) to which is constrained a pin (14) which sustains the thread (13), said spring (17) being able to maintain the mobile carriage (4) pushed towards the top.
3. A corkscrew, as claimed in claim 1, characterised in that it comprises a spring (18) which is inserted into a cavity (12) of the shaft (10) and connected to the plate (16) so as to elastically hold back the thread on the inside of the cavity (12).
4. A corkscrew, as claimed in claim 1, characterised in that the means used for constraining the toothed, hollow shaft (10) to the crosspiece (5) or, in alternative, the mobile carriage (4) to the

crosspiece (5), include a block (28) which is inserted into a housing (27) of the upper crosspiece (5), said block being provided with an upper fork (30) capable of being inserted between the teeth of the toothed, hollow shaft, and a lower fork (31) capable of being inserted into a notch (32) obtained in the mobile carriage, said block being subject to a slight horizontal oscillation for inserting or extracting, alternatively, the forks into or from the respective cavity.

5. A corkscrew, as claimed in claims 1 and 4, characterised in that it comprises a projection (33), shaped as an inclined plane, capable of acting on the upper fork (30) so as to carry out the insertion of the same into the respective cavity, a projection (34), shaped as an inclined plane, which acts on an inclined plane (35) obtained on the block (28) so as to carry out the insertion of the lower fork (31) into the respective notch (32) of the mobile carriage.
6. A corkscrew, as claimed in claim 1, characterised in that the cap (19) includes a cylindrical body

(19c) provided with slits (21) through which the flat springs (23) are inserted, said springs being capable of being inserted under the rim of the bottle neck for holding the bottle during the thread screwing phase.

7. A corkscrew, as claimed in claims 1 and 6, characterised in that the cap (19) includes two bars sliding vertically inside the cylindrical body (19c), said cap being able to hold the cork once it has been extracted from the bottle so as to allow the withdrawal of the thread (13) from the cork itself.



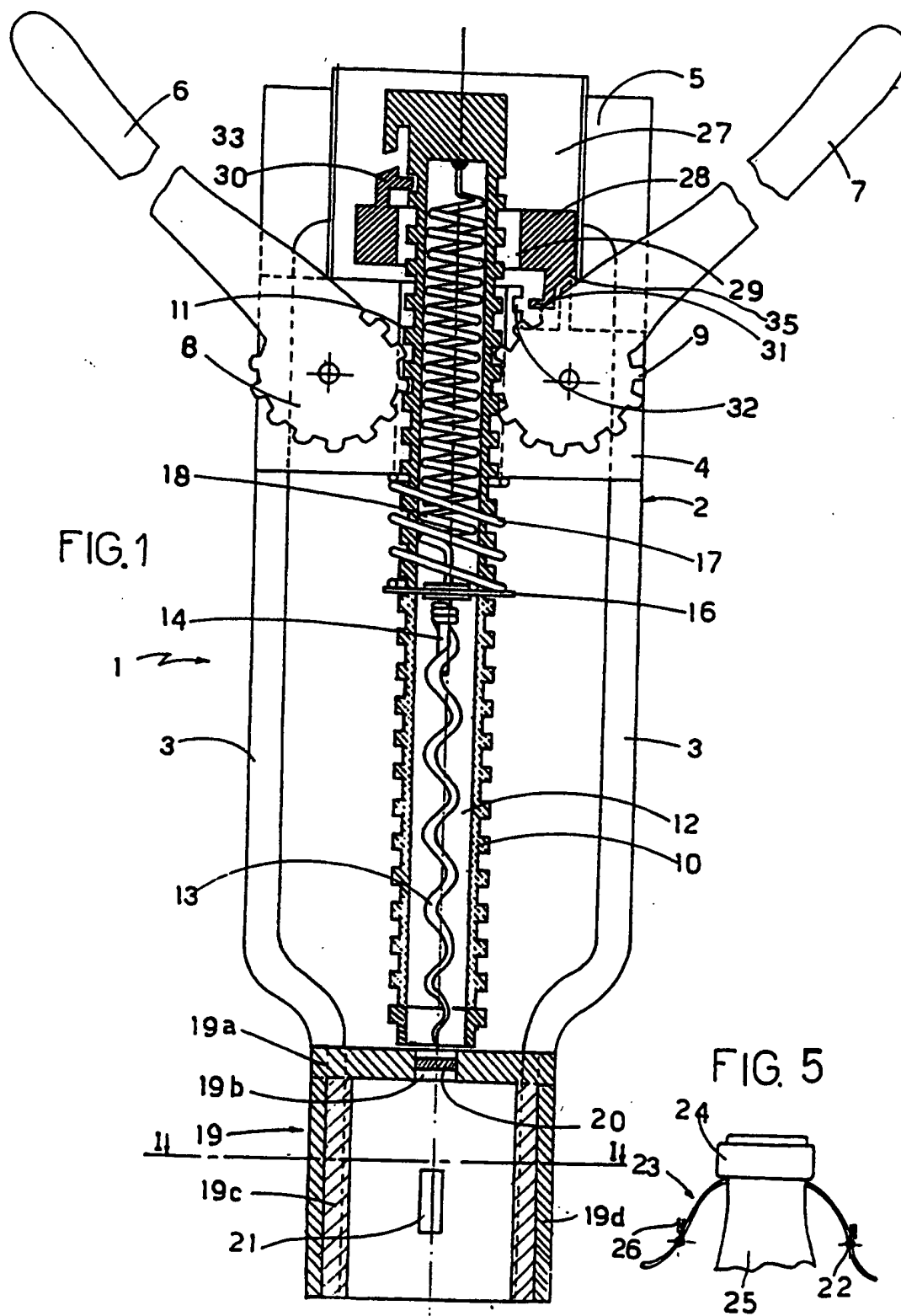
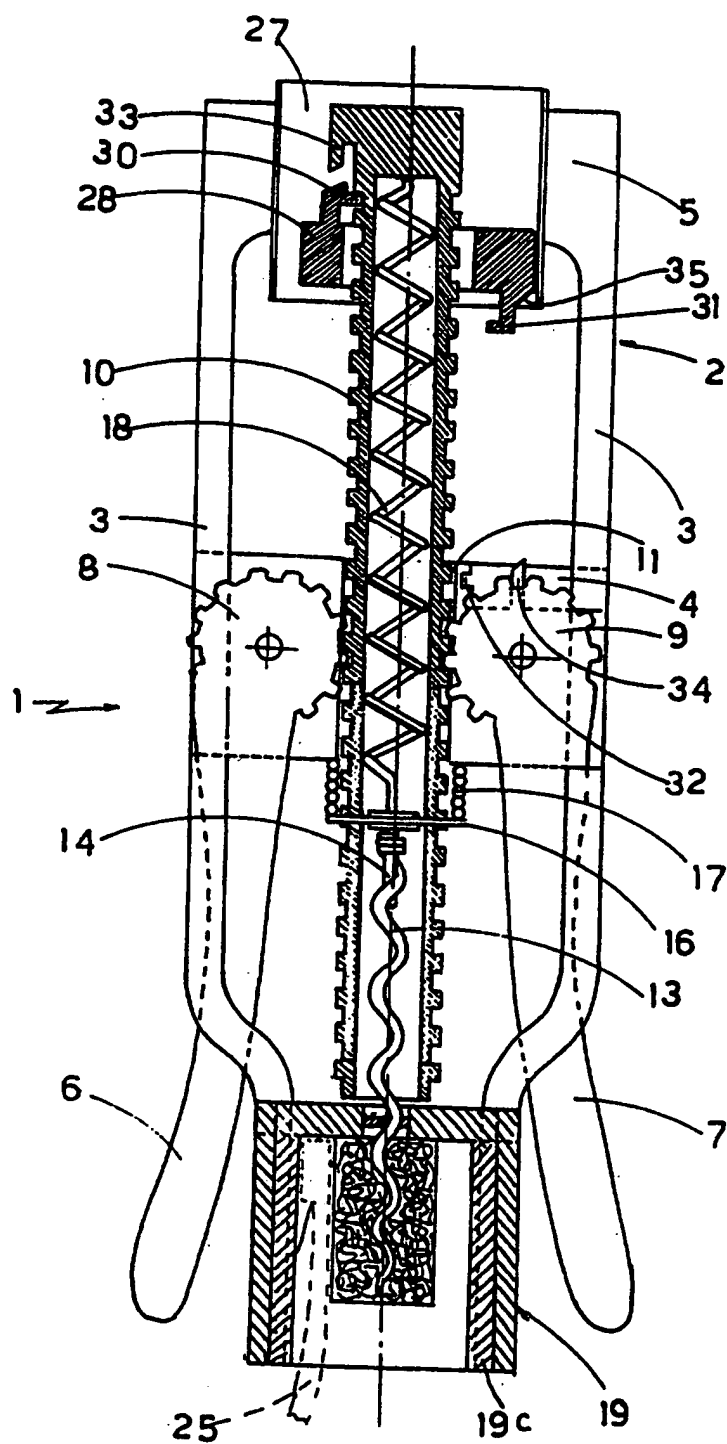
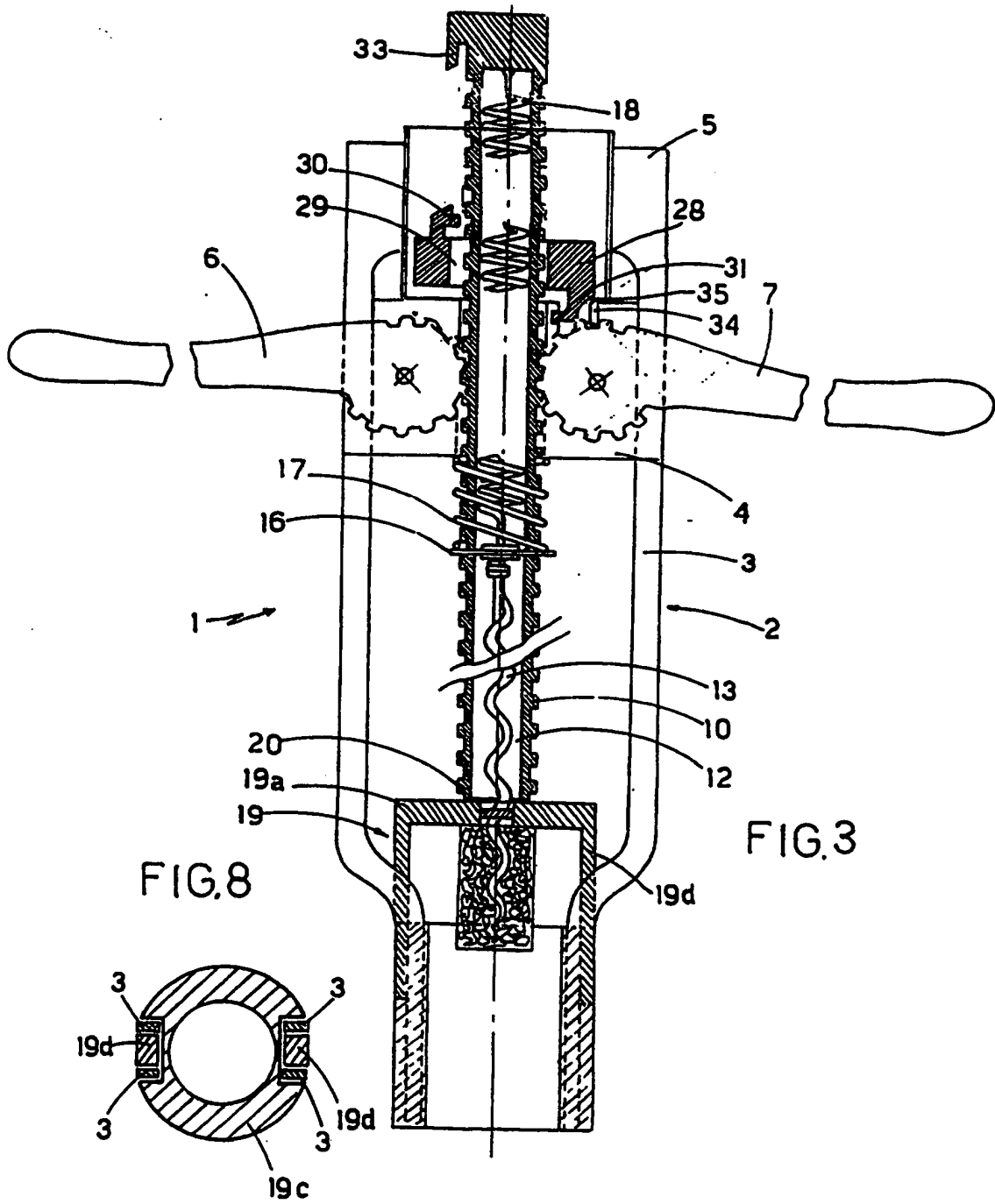
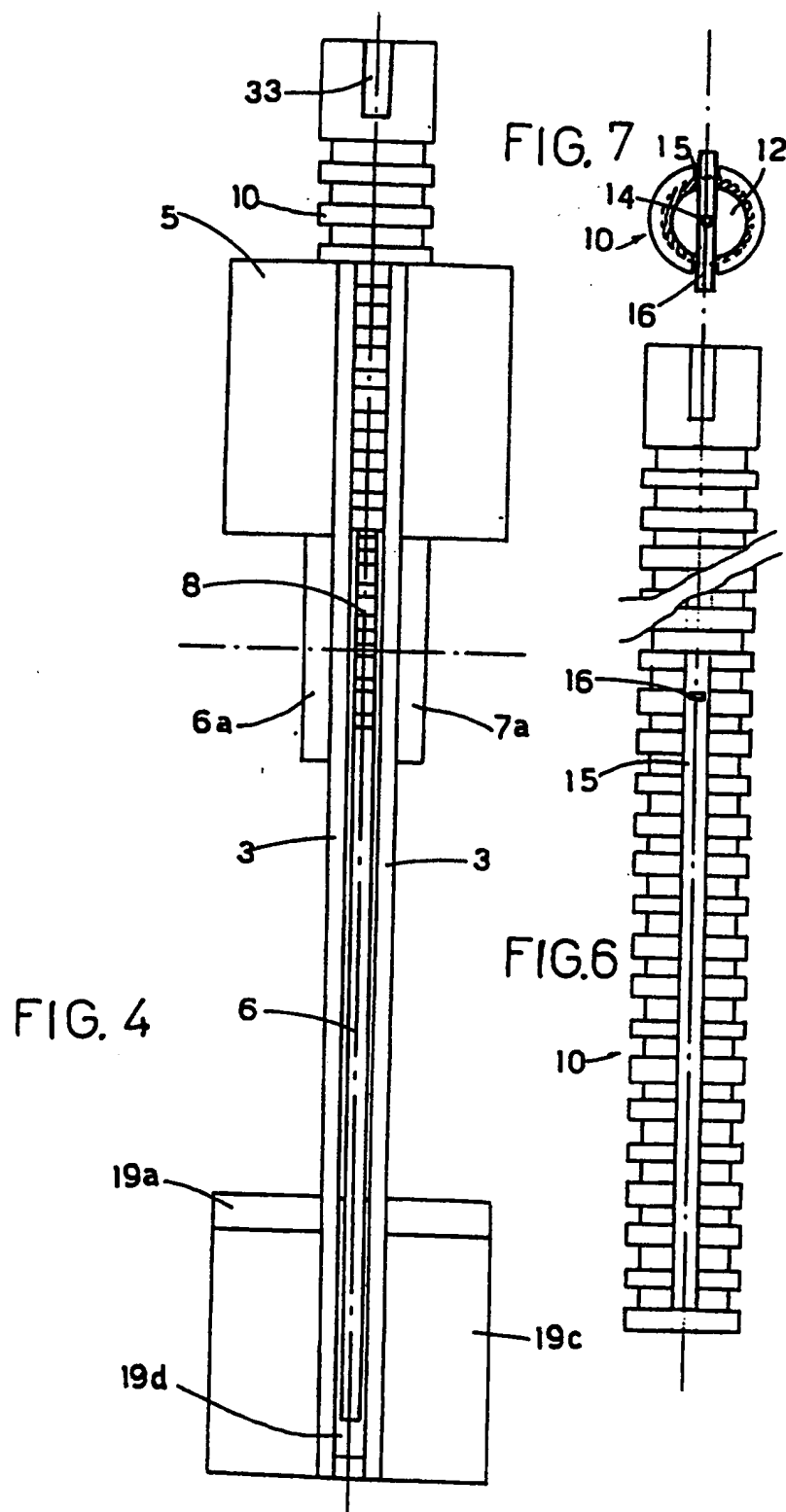


FIG. 2







# INTERNATIONAL SEARCH REPORT

International Application No  
PCT/IT 95/00182

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 B67B7/04

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 B67B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	DE,A,355 971 (JELINSKI) 10 July 1922 see figures	1
A	GB,A,2 127 795 (ALLEN) 18 April 1984 see abstract; figures 5,6	1
A	GB,A,1 490 040 (BEATRICE FOODS COMPANY) 26 October 1977 see figure 1	1

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**INTERNATIONAL SEARCH REPORT**

Information on patent family members

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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